

Status of Biotechnology in South Africa

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South Africa as a Case Study

- R&D for 20 years.
- Plant trials for 10 years (using existing policy).
- New GMO Act¹⁵ implemented in 1999.
- Only 4 commercial approvals by Oct. 2002.
- About 110 plant biotech groups (academic and research).
- Over 160 plant biotech projects.
- About 45 companies using biotechnology in food, feed and fibre.
- Public not informed; Anti-activists making an impact.

BACKGROUND

Biotechnology and

- Contribution to development & economic growth
- Contribution to an improved quality of life
- Environmental rehabilitation & conservation
- Food security
- Level of SA engagement
- Cabinet request for a National Strategy

Objective of the Strategy

To inform government and other role players about the steps that need to be taken for biotechnology to have a positive socio-economic impact

The National Biotechnology Strategy

Addresses the primary means by which government can influence developments...

- The legal and regulatory framework
- Institutional arrangements
- Evaluation, monitoring & communication instruments
- Creation of new infrastructure
- Development of research capacity
- Development of business ventures
- Funding mechanisms

Implementation Framework

- Biotechnology Regional Innovation Centres
- National Bioinformatics Facility
- NACI Biotechnology Advisory Committee
- NACI Bioethics Committee
- Special Biotechnology Studies/Investigations
- Legislative & Regulatory actions
- Public Understanding of Biotechnology
- GBIF membership
- ICGEB membership
- Biological Resource Organisations Network

National Development Imperatives

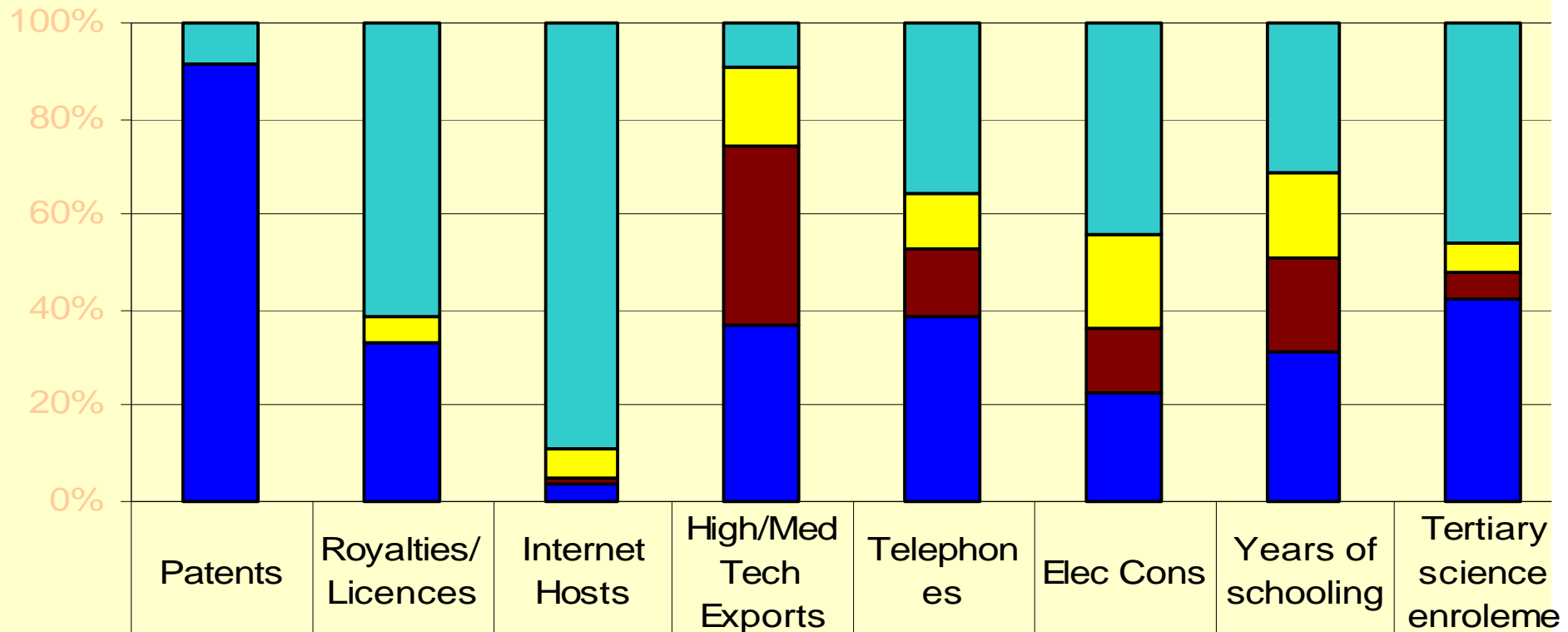
- Accelerated economic development
- sustainable development for poverty alleviation
- Rural development
- Small business development
- Human Resource Development
- Black economic empowerment
- Infrastructure development

National Biotechnology Strategy: Infrastructure

- Biological Resource Centres
- Biopharmaceutical Resource Database
- Bioinformatics Networks
- Improved SAPTO database

Technology Achievement Index: Component view

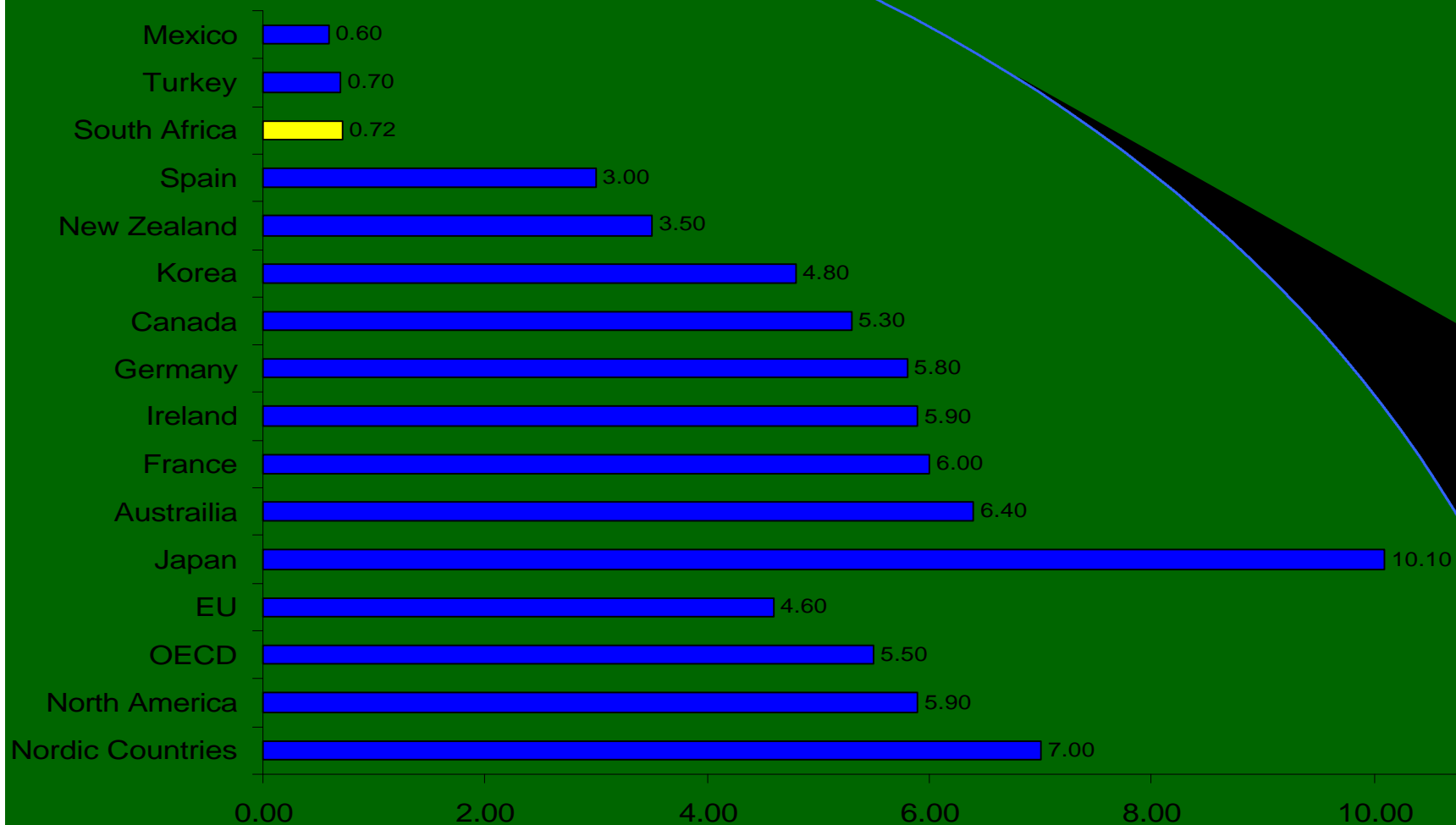
■ Korea ■ Malaysia ■ South Africa ■ Australia



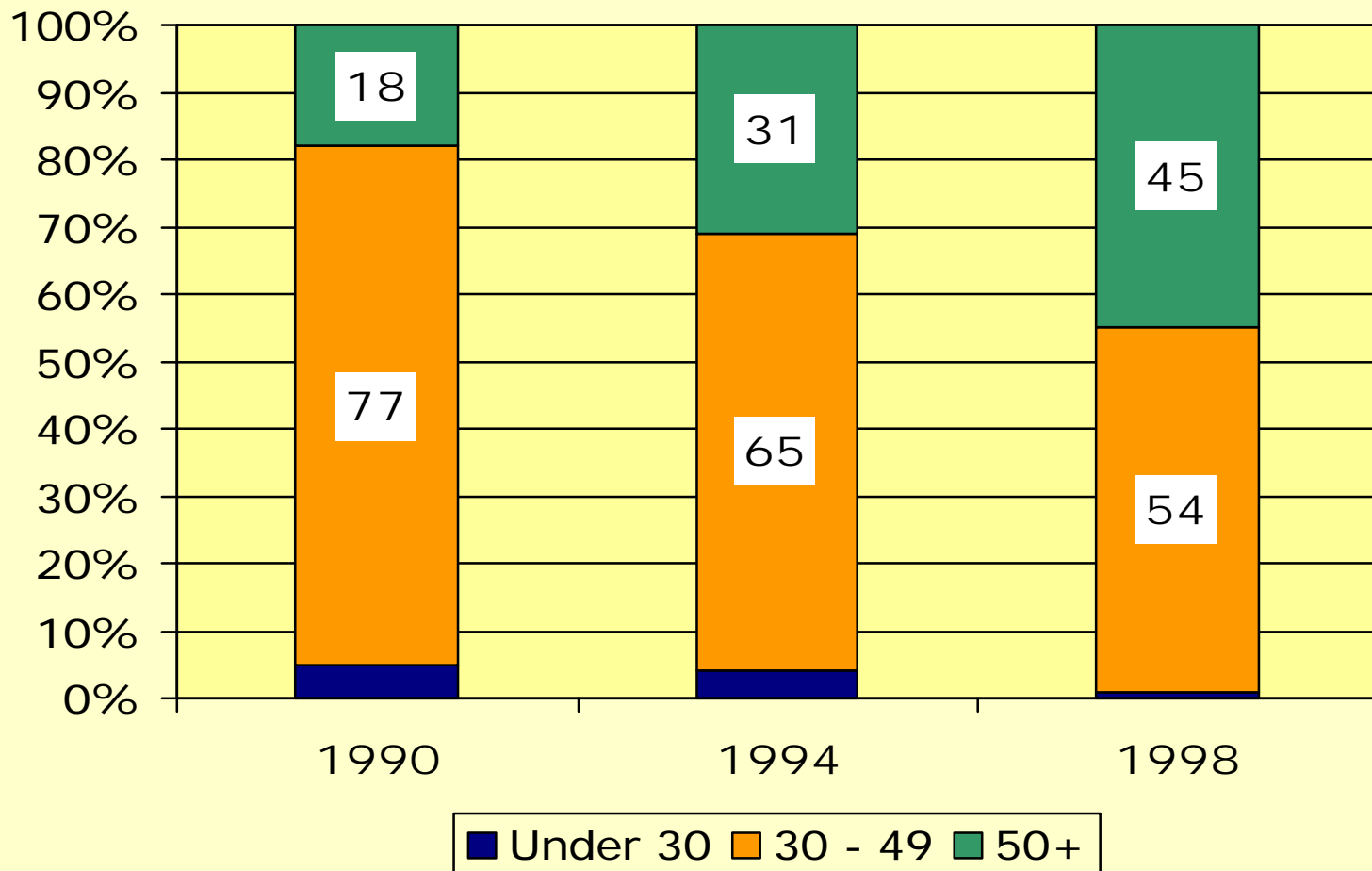
■ Australia	75	18.2	125.9	16.2	862	8717	10.9	25.3
■ South Africa		1.7	8.4	30.2	270	3832	6.1	3.4
■ Malaysia		0	2.4	67.4	340	2554	6.8	3.3
■ Korea	779	9.8	4.8	66.7	938	4497	10.8	23.2

Source: UNDP 2001

Researchers per 1000 of Labour Force



Research output – the ageing of the workforce



Scientific publications per million population

	1996	1997	1998	1999	2000
South Africa (1)	141	137	123	119	126
South Africa (2)	171	165	155	160	
Austria	599	657	696	717	
Denmark	1089	1117	1200	1214	
Finland	1005	1048	1080	1157	
France	610	618	653	652	
Germany	584	608	661	657	
Ireland	448	479	527	542	
Netherlands	935	972	977	963	
Portugal	156	179	199	248	
Spain	387	415	446	471	
Sweden	1328	1335	1402	1431	
UK	930	896	929	949	
USA	726	709	709	708	
Japan	445	447	485	498	

South Africa (1) = SAPSE (Higher Education)

South Africa (2) = Whole System

Biotechnology Regional Innovation Centres

- “Value-chain” consortium of interests
- 3 or 4 Research programmes (\pm 20 projects)
- Incubator (\pm 20 tenants)
- Alignment with national development imperatives and local expertise
- Capital equipment & specialised expertise shared by the programmes, industry and tertiary education
- Biological Resources Centres
- Application of existing funds and new (BRIC) allocations
- Integration within the cluster and with NBF
- Management – largely coordination

National Bioinformatics Facility

- Focus on developing critical mass of expertise and a technology platform for biotechnology research programmes
- Major investment in communications infrastructure
- Training of Facility personnel
- Course work in bioinformatics at tertiary institutions
- Integration with BRICs

National Technology Development, Transfer & Diffusion Interventions

- ❑ **GODISA (Technology Incubators)**
- ❑ **Tshumisano (Technikon/SME partnerships)**
- ❑ Innovation Fund
- ❑ Support Programme for Industrial Innovation
- ❑ Technology for Human Resources in Industry Programme
- ❑ Science Councils' core programmes
- ❑ International LEAD Programme
- ❑ Regional Co-operation Programme

Technology Roadmaps

5-10 year “strategic commitments”

- Research strategy (SETIs, Innovation Fund, SPII, Industry, HE sector)
- HRD strategy (NRF, HE sector, SETAs, THRIP)
- Infrastructure investment strategy

Public Consultation Process

- 182 people attended the information sessions
- Total responses 87
- Only 14% not in support, but in opposition to GMOs not the strategy
- Recommendations for fast-tracking HR endorsed
- Strong concerns that funding inadequate
- Commercialisation aspect to be strengthened
- Assessment of economic impact of GMOs on export markets
- Ethics, Safety and IPR inadequately dealt with
- Public understanding not to be achieved through indoctrination but through objective education
- Community upliftment and SME development
- Process issues

Key constraints in Biotechnology in Africa

- Insufficient capacity in agricultural biotechnology.
- Inadequate and non-sustainable funding of research and development.
- Lack of appropriate policy at national and regional levels.
- Most countries have no biosafety structures in place.

Key constraints in Africa cont.

- Lack of accurate information and education on agricultural biotechnology.
- Negative perceptions being created by active anti-biotechnology campaigners.
- Insufficient linkages to international biotechnology organisations.
- Limited public/private sector partnerships in biotechnology.

Possible Solutions and Actions

- Pool resources to provide regionally training, R & D (USAID) projects and information sharing.
- Transfer skills in developing policy & regulations from regional & international sources. (USAID)
- Develop a database of accurate information & training programmes that can be distributed through regional biotechnology hubs.
- Develop strategies to speak globally about Africa's needs and results (a proactive media campaign is required)

Possible solutions cont.

- Develop a proactive approach to showing the benefits of the technology for small-scale farmers & consumers in Africa.
(USAID)
- Facilitate private sector/public sector partnerships and international linkages. (USAID)
- Develop & distribute a database of international organisations wanting to work with African institutes on African crops.

